DOCUMENT RESUME

ED 144 913 SO 010 398

AUTHOR Feinman, Saul
TITLE Food Sharing: An Evolutionary Perspective.
PUB DATE Sep 77
NOTE 29p.; Paper presented at Annual Meeting of the American Sociological Association (Chicago, Illinois, September 5-9, 1977)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Altruism; Anthropology; Behavior; Behavioral Sciences; Cultural Context; Cultural Factors; Evolution; *Food; Human Living; Human Relations; Interaction; *Interpersonal Relationship; *Prosocial Behavior; Reproduction (Biology); *Social Behavior; Social Relations; Sociocultural Patterns; Sociology
IDENTIFIERS *Sociobiology

ABSTRACT

Food altruism and the consumption of food are examined from a sociological perspective which assumes that humans share food as inclusive fitness actors. Inclusive fitness implies the representation of an individual's genes in future generations through his own or others' offspring. The discussion includes characteristics of food sharing among kin as well as among genetically unrelated individuals. Eleven hypotheses are stated about acts of food altruism, in which one individual increases the fitness of another individual at the expense of his own fitness. The hypotheses state that (1) an individual will engage in more food altruism with a close relation than with a distant one, (2) given two persons with equal relationship with the altruist, he will share food with the one who has a higher probability of producing offspring, (3) food will be shared with a group member rather than with a group outcast, and (4) if food is stored, there will be less food altruism than if food is not stored. Examples of specific hunter-gatherer societies support the hypotheses. A concluding section explores the relationship of biology to sociology in terms of implications for social science research. (Author/AV)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED144913

OCT 26 1977

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Saul Feinman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

Food Sharing: An Evolutionary Perspective

Saul Feinman

University of Wyoming

I would like to thank the following people for their valuable comments on earlier drafts of this paper: John Baldwin, Susan Feinman, Anthony Glascock, Mark Granovetter, William Irons, Allan Mazur, and Pierre van den Berghe.

Paper prepared for presentation in the session on Altruism and Cooperation at the American Sociological Association Meeting, September 5-9, 1977, Chicago, Illinois.

Author's address: Department of Sociology
University of Wyoming
Box 3293, University Station
Laramie, Wyoming 82071

SP 010 398

Food Sharing: An Evolutionary Perspective

Food sharing and social consumption of food are common behaviors in many human societies. These practices are associated with friendship in that they can both lead to and result from friendship (Sahlins, 1972; Krebs, 1970). When a close friend comes to visit, he is offered food, and a refusal to accept is interpreted as a challenge to the friendship (Foster, 1967). It may be possible to evaluate the intimacy of relations by the extensiveness of food sharing; acquaintances are invited for coffee only, while intimates stay for dinner. Among children, affect may be expressed by inviting another child home for a meal. Food sharing is one characteristic of what is perhaps the most intimate of human relations -- the mother-infant dyad.

We not only share food with others, but we also consume together in a social setting. Social consumption of food is an occasion for sociability as well as nutrition. Just about all of the important social events in modern American society and in most other societies are associated with the collective eating of shared food and drink. It is interesting to note that sociability seems to form easily in eating and drinking places such as pubs (Young & Wilmott, 1957).

While there is an extensive social science literature on altruistic behavior, very little is concerned directly with food sharing. Goldschmidt (1966) has noted that food sharing is near universal among human societies and varies considerably in its expression. Two social psychological studies have found that children share food in natural and experimental settings even if food sharing is not suggested to them (Dyson-Hudson & Van Dusen, 1972; Staub & Sherk, 1970). The relationship of food sharing to sociability is apparent in Dyson-Hudson & Van Dusen's finding that of the three children

(out of 46) who did not share, one was shy, another was extremely aggressive, and a third had been ostracized by the group. The high frequency and the ease with which this behavior occurs leads one to wonder whether food sharing and social consumption of food have been selected in the course of human biological and cultural evolution. This is the question that is explored in this paper.

Altruism, Sociobiology, and Cultural Selection

Altruism -- an act in which one individual increases the fitness of another individual at the expense of his own fitness (Wilson, 1975, p. 117) -- is a very important topic in modern social science. A vast research enterprise has considered it in social psychology, and it has attracted considerable attention in sociology (Gouldner, 1960), and in anthropology (Sahlins, 1972). In the new field of sociobiology, altruism has attracted much attention and effort, as it is considered both a puzzle and a key to the understanding of social behavior (Barash, 1977; Dawkins, 1976; Wilson, 1975; Hamilton, 1975). Of the various media of altruism, food is clearly one of the most important. The need for food and water are common to all human societies. If any type of altruism will have an affect on social relations and survival, sharing of food is a likely candidate. Wilson (1975) has asserted that except for suicide, food altruism is the most clearly altruistic behavior that an animal can do.

In modern social science, altruism has been studied in terms of its proximate rather than its ultimate causes. Researchers have been more concerned with isolating the immediate factors that lead to variation in altruistic response than in looking at the question of what purposes altruism serves for humans. As the importance of functionalism has declined in social

science fields, questions of ultimate causation have decreased in frequency. Nevertheless, such questions are important to ask, since the answers can shed light on the nature of humans and the processes by which we evolved.

Questions of ultimate causation, i.e., questions that ask what functions or adaptiveness a behavior conveys are found in the relatively new theories of cultural ecology (Harris, 1974; Vayda, 1969) and sociobiology (van den Berghe, 1974; Wilson, 1975). While these perspectives differ in their assumptions about whether evolution of social behavior has a genetic basis and whether the unit of selection is the individual or the society, they share in common an approach in which behaviors and cultural patterns are examined in terms of their contributions to fitness and a concern with how they evolved and were selected. In this paper, I will use such an evolutionary perspective in considering the adaptiveness of food altruism and social consumption of food in human societies.

Sociobiology assumes that human social behavior evolves through the processes of natural selection and social selection by which individuals whose genes lead to adaptive behavior are selected for and are more highly represented genetically in the next and future generations. While most sociobiologists of human behavior do not believe that genes are the sole determinant of response (Chagnon & Irons, forthcoming), a genetic component is usually assumed. There is almost no empirical proof for either side of this issue, especially concerning human behaviors such as altruism, selfishness, territoriality, and aggression. Thus, sociobiological approaches may be weakened by this unproven assumption. It turns out that there is little need to make this assumption; sociobiological approaches can provide very important hypotheses about human evolution without making this assumption.

An alternative is to allow for cultural as well as biological selection that results in greater inclusive fitness. Inclusive fitness (Hamilton, 1975) can be seen as the representation of an individual's genes in future generations, whether through his own offspring, or through others with the same genes. A synthesis of biological and cultural evolution has been proposed by Durham (forthcoming), and is adopted in this paper. In cultural selection, individuals who retain cultural practices that are adaptive will be more likely to be reproductively successful. Since culture is transmitted in kin-based groups in most human societies, adaptive cultural patterns will continue in future generations. Through either natural selection or cultural selection, adaptive behaviors can lead to increased inclusive fitness.

From this coevolutionary viewpoint, food altruism and social consumption of food will be examined as to their adaptiveness. If they are more adaptive than other practices concerning food, those who practice them are likely to have higher levels of inclusive fitness. While there is very little data on humans that has been designed to study adaptational hypotheses about food altruism, it will be possible to look at other studies and ask whether food altruistic behavior increases the probability that an individual will increase his inclusive fitness. With rare exceptions (Irons, forthcoming), there is very little data collected which relates the appropriate demographic indications of inclusive fitness to social practices.

An Evolutionary Theory of Food Altruism

The remainder of this paper is concerned with the development and consideration of a number of hypotheses concerning food altruism. These hypotheses will be developed from a sociobiological perspective, but no assumptions will be made about the genetic or cultural bases of these

patterns. The general communality to this set of hypotheses is a basic theorem in sociobiology -- that individuals act as if they were attempting to maximize their inclusive fitnesses.

The individual actor in this theory seeks to maximize inclusive fitness in the same way as the rational actor of exchange theory seeks to maximize perceived profit. Behavior is based on a Cost/Benefit analysis such that it will occur when the cost to inclusive fitness is lower than the benefit to inclusive fitness. Two mechanisms that have been proposed for the inclusive fitness seeking process are kin altruism (Hamilton, 1964) including parental investment (Trivers, 1972) and parent-offspring conflict (Trivers, 1974), and reciprocal altruism (Trivers, 1971). Although Hamilton (1975) is correct when he asserts that inclusive fitness involves more than just kin selection, and by implication that reciprocal and kin altruism actually operate by the same mental calculus, separate description of each mechanism is more useful in this paper. In kin altruism, the individual will increase inclusive fitness by helping his kin maximize genetic representation in future generations. In this, he will act to produce his own offspring directly, and help other kin produce their offspring. If an individual helps a close kinsman, reciprocity of altruism by that kinsman is not needed for the inclusive fitness of the individual to increase. In this behavior, the individual considers his relatedness to the kinsman in deciding how much to invest.

In reciprocal altruism, the recipient is not a kinsman of the altruist, but benefit is gained by the altruist if the favor is reciprocated at a later time. Since the recipient is not related to the altruist, the increase in the genetic representation of the recipient's genes does not increase the

inclusive fitness of the altruist. Instead, the return of the favor by the recipient will be the benefit in that it will increase the survival of the altruist and his kin.

Since kinship is not an all or nothing thing, any altruist-recipient relationship will be more or less reciprocally or kin-based. In situations which are closer to the kin altruism type, there should be less stress on reciprocity than in situations in which there is little relatedness. If we assume that the inclusive fitness actor uses these mechanisms to maximize fitness, a number of hypotheses can be proposed concerning food altruism.

The first hypothesis is the most basic. It would be sensible for the individual to engage in more food altruism with close kin than with other people. In many kin altruism relationships, benefit can derive from reciprocity as well as furtherance of the genes of related individuals. Thus:

1. All other variables being equal, an individual will engage in more food altruism with a close relation than with a distant relation.

An effective individual will condition this general tendency. One possibility is that he will not invest as much altruism in all relations of equal relatedness (r). He will be more likely to help those individuals who have a higher probability of producing offspring. Thus, the relatedness of the individual is ½ with both his child and his parent. But, he may be more likely to help his child, since his parent is less likely to produce more viable offspring. This is expressed in Hypotheses 2:

2. Given two persons of the same r with the altruist, he will be more likely to share food with the one who has the higher probability of producing offspring.

Hypothesis 2 suggests that old people would often not receive food altruism. On the basis of kin altruism, an inclusive fitness actor should not provide food for his parents. But, on the basis of reciprocal altruism, parents may help in child rearing and other nonreproductive activities. Food altruism is justified on the basis of reciprocal altruism. Thus, Hypothesis 3 asserts that:

3. Given that there are two individuals who are close kin of the altruist but cannot produce any more viable offspring, the individual will engage in food altruism towards the one who is more likely to help in nonreproductive activities that will increase the inclusive fitness of the altruist.

If the altruist is to differentially respond to individuals of varying relatedness, he must be able to measure kinship. How do humans recognize kin? One mechanism is the development of cognitive categories that are learned and designate individuals of different levels of relatedness. Another possibility is that more "primitive" mechanisms exist. Parker (1976) has argued that one way we come to define relatedness is by frequency of contact, and by implication, proximity. Along a similar line, Sahlins (1972) has suggested that since close kin are likely to live in the same group in many human societies, we define kin as those who live in our group. Thus, we have Hypotheses 4 and 5:

4. An individual is more likely to share food with a person who lives in proximity to him and with whom he is familiar than one who lives at a distance and with whom he is unfamiliar.
5. An individual is more likely to share food with a person who is perceived as being a member of his group than one who is perceived as outside the group.

As Bowlby (1973) and Barash (1977) have pointed out, an individual acts on the basis of what he perceives is in his best interest. Thus, it is reasonable to further hypothesize that not only will the real kin relationship affect food altruism, but so will the perceived relationship:

6. Given two persons of the same r, an individual will be more likely to share food with the one whom he perceives as having the higher r.

In altruistic relationships, there is sometimes benefit in cheating -- in not reciprocating. A close kin who does not reciprocate provides less for the altruist to worry about than a nonkin who does not reciprocate. Thus, it would be reasonable to expect that the altruist would be more concerned with reciprocity when r is small than when it is large.

7. The greater the r between the altruist and the recipient, the more the altruist is concerned with reciprocity.

In a similar manner, the recipient will probably be more likely to cheat when the altruist is of low r. While it is beneficial to help close kin, it is also beneficial to get altruism from strangers and not return it when possible.

8. Given a set probability of another interaction, the recipient will be more likely to cheat on the altruist as the r between them decreases.

The conditions in which a society resides provide important qualifications and elaborations to some of the above hypotheses. The more scarce food is, the more concerned altruists should become with close kin than distant kin. The relationship proposed for the effect of scarcity puts an upper limit on the effect of decreasing scarcity on differential altruism to

close and distant kin.

9. The difference between the amount of food altruism given per close kin and distant kin will be moderate under conditions of abundance, small under conditions of moderate scarcity, large under conditions of strong scarcity, and will then to decrease to zero as scarcity becomes extreme, i.e., as starvation approaches.

In a similar vein, the effects of the fluctuation of the food supply on food altruism can be considered. It seems reasonable that if there is a lot of fluctuation in the availability of a food source that sharing it, even among nonkin, will be beneficial. If at a given time, some individuals will have the food and others will not, fluctuation should increase food altruism.

10. Given that the unreliability of a food source means that some individuals will have that food while others will not and that an individual can expect to sometimes have the food and sometimes not, the greater the unreliability of a food source, the greater the amount of food altruism an individual who has the food will engage in.

Finally, the effect of the storage of food will be considered.

11. If food is stored, an individual will be less likely to engage in food altruism than if food is not stored.

These hypotheses can be seen to fit within an evolutionary framework. They are similar to hypotheses that would be developed from a sociobiological perspective. While the purpose of this paper is not to subject these hypotheses to a rigorous examination of their confirmation status, a brief consideration of some human societies will be presented to indicate that these hypotheses

are reasonable and are worthy of systematic examination. Since some writers have wondered about whether adaptations that have followed the Neolithic Revolution are adaptive, I have restricted this consideration to a number of hunting and gathering societies. It must be stressed that these societies are not to be considered a systematic sampling of hunting and gathering societies.

Food Altruism among Hunter-Gatherers

If individuals are engaging in food altruism behavior to maximize their inclusive fitness, it is reasonable to expect conflict among individuals. The reason for this is that since each individual has somewhat different genes, each will pursue inclusive fitness in a different direction. In other words, individual selection for inclusive fitness models suggest that there will be conflict in food sharing, while a group selection model would not make such a prediction for individuals in the same group. An examination of ethnographic materials on some hunter and gatherer societies finds support for the individual selection model. Dowling (1968) points out that many hunter-gatherer groups have individuals who try to hoard food from nonkin, and that rules and sanctions must be developed to act against these tendencies. Among the Copper eskimos (Damas, 1972), men will fight with each other in obtaining the best cuts from shared seal meat. In this process, men attempt to cut out the best pieces for themselves and they are allowed to cut the fingers of other men if necessary. The willingness to take the chance of getting one's fingers cut is considered a sign of manhood in this group.[1]

In a similar, though not as dramatic fashion, conflict can be seen in other societies concerning the sharing of food. Marshall (1961) noted a

high degree of self-interest and suspicion among the !Kung Bushmen in food sharing and in other behaviors. Turnbull (1966) found that Pygmies share food but do so with considerable antagonism and argument over its distribution. Thus, it is quite reasonable to conclude that food sharing often entails conflict since selection is on the individual level.

Do individuals share more food with close kin than with more distant kin? In general, the answer to this question (Hypothesis 1) is "yes." Some of the exceptions can be explained in terms of the relationship of scarcity to food altruism (Hypothesis 9). Henry (1951) found that among the Pilaga, food sharing was more likely with close kin. A similar effect was found by Marshall (1961) for the Bushmen. Sahlins (1972), in his consideration of many hunter-gatherer groups noted that food sharing with kin was very common and normative. Kin were more likely to receive food in many societies. There are reasons why some kin receive more food and why kin do not receive food in some circumstances and these will be discussed below.[2]

Is there any discrimination among kin in terms of their ability to reproduce or to help in nonreproductive activities (Hypotheses 2 and 3)? While this has not been studied systematically in most ethnographies, there are some interesting hints. In many societies, food is shared with old, sick, and crippled people. Whether a conflict concerning whether to feed an old parent or one's own offspring would result in feeding the child has not been considered. But, in the Hadza, Woodburn (1968) reports that there is a special obligation to share meat with any pregnant woman. Assuming that this altruism is reciprocated among nonkin, such practices act so as to get food to individuals who display high probability of reproduction.

Among various eskimo groups (Damas, 1972), old people are given food

with no expectation for reciprocity. But, when the group travels, old people who cannot keep up with the group are left behind (Balikci, 1968). There is no indication in the ethnographic materials on Eskimos concerning what old people may do to reciprocate for their food. In some other ethnographic materials, these contributions can be seen. Among the Pygmies, Turnbull (1966) found that old people often stayed with children while other adults hunted. Since both males and females hunted and cooperation of a large number of hunters was needed, the old people who watched the children performed a service to other adults. There is an analogy between this reciprocation and that appearing among wild dogs in which some adults stay with the young while the others hunt. When the hunters return, they feed those adults who have stayed in the den with the young (H. & J. van Lawick-Goodall, 1970).

An illuminating set of findings are presented by Hart and Pilling (1960) concerning the Tiwi. In this society, old women are often valued because they contribute to the supervision of gathering. Often, a young man will attempt to marry a widow, as well as younger women in order to have someone in his household who can help collect food. On the other hand, there is no mention of a contribution made by old men. It is interesting to note that while food is shared with both old women and old men, a hunter appears to feel resentment towards his old father and not his old mother when presenting them with food. In this case, an old person who does not perform nonreproductive tasks and cannot contribute reproductively to the altruist's inclusive fitness is not shared with as easily as one who does help out.

Do proximity and group definition as elicitors of a kinship response result in more food altruism (Hypotheses 4 and 5)? Henry (1951) noted that a person who lived in an individual's household, even if he was not a

close kin, received a high level of food altruism and was defined as having a close tie with the individual. Damas (1972) found that in dwellings where two loosly related families lived, there was more food sharing among the families than the average. Other eskimo material (Damas, 1972) indicate the viability of Hypotheses 5 and 6. Damas noted some variation among Copper, Netsilik, and Iglulik eskimos in that a wider range of people were recipients of shared food among the Iglulik and that kinship ties were more widely recognized among this group. The basic group unit seems to be more widely defined among the Iglulik. While there is no indication that there is greater interrelatedness within groups of Iglulik, they appear to perceive kin more extensively. A wider perception of the group and of kinship may have resulted in the wider sharing of food. Unfortunately, a competing explanation concerning differential scarcity complicates the group-kin recognition explanation. The effects of differential scarcity will be considered below.

The effect of kinship on the concern with reciprocity can be seen in several studies (Hypotheses 7 and 8). Sahlins (1972) has argued that the closer the kin relation, the more likely it is that generalized reciprocity will be the norm. He bases this conclusion on the consideration of many primitive societies. Relations with more distant kin are characterized by balanced reciprocity, while relations with strangers or enemies are characterized by negative reciprocity, i.e., cheating. Damas noted that this rule did not seem to apply to the Iglulik eskimos who engaged in generalized reciprocity even when dealing with the larger village. One possibility is that the Iglulik recognize a wider range of kinship and are therefore responding to more people with a pattern of generalized

reciprocity that is appropriate when dealing with kin.

Among Copper and Netsilik eskimos (Damas, 1972), there is always generalized reciprocity within the family unit but expectations for reciprocity characteristic of a balanced relationship when dealing with more distant kin. This was illustrated in the existence of sharing partners who were obligated to share with each other and to reciprocate. Other studies discussed by Sahlins (1972) have indicated that while generalized reciprocity is expected for altruism among close kin, balanced reciprocity was the norm when dealing with more distant kin. Other studies discussed by Sahlins (1972) have indicated that while generalized reciprocity is expected for altruism among close kin, balanced reciprocity was the norm when dealing with other groups or moieties. Interestingly, Turnbull (1966) reported that Pygmies often engaged in cheating when dealing with villagers or other outsiders.

How does the nature of the food supply and its reliability affect food altruism (Hypotheses 9, 10, and 11)? In general, it has been found that in societies in which there is a relative abundance of food, there is sharing among close kin, especially those who do not have access to obtain such food, but not much sharing is engaged in among nonkin. Such groups include the Hadza (Woodburn, 1968), the Tiwi (Hart & Pilling, 1960), and probably hunters and gatherers of earlier times (Lee, 1968). In the Tiwi, a large catch of kangaroos in a group hunt resulted in very little sharing of meat except among family members, since there was enough to go around (Hart & Pilling, 1960). If there is somewhat more environmental pressure in the form of less food, there seems to be sharing with a wide variety of people,

close and distant kin alike. The Iglulik eskimos (Damas, 1972) may be in this category. As environmental pressure mounts, there is a tendency to share more with kin and less willingly with nonkin and distant kin. Damas (1972) noted that the Copper and Netsilik eskimos lived in a more demanding environment with less food than the Iglulik and that they shared with a narrowly defined group on the basis of generalized reciprocity. The existence of elaborate rules for seal sharing partners may indicate the resistance of hunters to share with distant relations. In this situation, sharing by the altruist with kin was maintained, while sharing willingly with nonkin seems to decrease.

What happens when a society is characterized by extreme food supply pressure, i.e., starvation? One case of such a situation was found in the Ik (Turnbull, 1972). As the food supply decreased, the range of people with whom an individual will share decreased. In the final stages of the famine, cases of denial of food altruism among mates, parents and offspring, and siblings were found. Each individual saved all food for himself. This trend can be interpreted as a tendency to require a very close relatedness between the altruist and the recipient. The altruist has a relatedness of unity to himself. If scarcity is extreme, an individual may restrict his sharing to those individual who have a relatedness of "1" to him, i.e., to himself. In this situation, sharing with both close and distant kin ceased.

The unreliability of the food source influenced food altruism patterns (Hypothesis 10). One of the most common features of food sharing among hunter-gatherers is that vegetable food is rarely shared, while meat is often shared. In fact, most food sharing in hunter-gatherers involves the sharing of meat (and fish). This is particularly true of nonkin

exchanges. It was likely that on a given day, some individuals would not have succeeded in acquiring meat while other would have succeeded. Reciprocality protected each hunter and his close family from having to do without meat when he failed to get any himself. Within the family group, meat is shared by the hunter with members of his family who cannot get meat on their own. Vegetable food is gathered by women as well as men and is usually not shared. It is possible that the apparent effect of unreliability of meat acquisition on food altruism is really a function of the fact that men usually acquire meat while both men and women acquire vegetables. Thus alternative explanation is viable only for sharing patterns in family groups.

The effect of storing food is difficult to evaluate (Hypothesis 11) since almost all groups do not store meat. It is interesting that one group that does have the technology for storing meat but does not do so -- the Hadza (Woodburn, 1968), lives in an environment of little scarcity. Some eskimo groups store food (Damas, 1972; Goldschmidt, 1966), but the correlation with frequency of food altruism is not clear.

In examining ethnographic studies of hunter-gatherers, it became apparent that factors other than those proposed in Hypotheses 1 through 11 were operating to select for food altruism. Food altruism appeared to have a sociability function in many societies. Food was shared with visitors (Service, 1966; Sahlins, 1972). Such sharing of food among visitors, as well as among friends, would seem to serve to relieve tensions and facilitate intergroup and interpersonal relationships. Such an effect seems to be found in modern American society as well. Why is it that sharing food not only will increase nutritional benefit, but will also increase inclusive fitness by decreasing antagonism among groups and within groups? Marshall

(1961) reports that the !Kung Bushmen are aware of the tension relieving qualities of food sharing. It may be that food sharing is perceived as something that is done among close kin, particularly when the sharing is done in a generalized reciprocal manner. In such a stiuation, the recipient may perceive himself as close kin to the altruist. A similar effect may occur for the altruist. Sahlins (1972) notes that among the Kuma, sharing of food among affinal relatives in celebration of a marriage includes encouragement from the host for his new relatives to join and share food as if they were consanguineal kin.

A similar effect may occur from the social consumption of food. If eating together is perceived as something that close kin do, then an invitation to eat together may be perceived as an indication that the altruist regards the recipient as a kinsman. Another advantage to social consumption of food is the possibility for social learning, especially among the young. Altmann and Altmann (1970) hypothesized that the baboon practice of touching each other's muzzles while eating is one way on which information about new foods and about the safety of foods can be transmitted among kin. If eating in humans were solitary, it would probably be more difficult for individuals to learn about the edibility of foods and about new foods. In such a setting, it is likely that there would be a decrease of inclusive fitness because kin, particularly offspring would be more likely to die from eating poisonous foods. Since social consumption of food is likely to occur within the context of family groups, this practice would contribute to inclusive fitness.

Another possible explanation of sharing of meat from a hunt is that collective hunting sets up the basis for sharing of meat from the kill. It

has been shown that collective hunting is more efficient than individual hunting (Kruuk, 1966). It may be that collective hunting was selected for in human evolution, and that food sharing after the hunt followed. Such an explanation seems to fit the food sharing patterns in Pygmies (Turnbull, 1966), eskimos (Damas, 1972) and the Tiwi (Hart & Pilling, 1960). It may be that collective hunting was selected for and led to the development of food sharing.

Since meat sharing makes up almost all of food sharing in humans, the adaptiveness of such sharing would seem to depend on the importance of meat within the hunter-gatherer diet. Among the eskimo, meat sharing is crucially important since vegetable foods are almost always unavailable. In other groups, vegetable foods constitute the bulk of the diet, and protein can be obtained from some vegetable sources (Lee, 1968). The advantage of accessibility to meat is that it provides for a more varied diet which acts to prevent overspecialization. Thus, it would seem that meat sharing is important even in societies in which meat is not a major source of food in the diet.

It is interesting to note that among the mammals phylogenetically similar to humans -- primates -- and those ecologically similar -- social carnivores (Schaller & Lowther, 1969), food sharing is common among social carnivores and chimpanzees (Schaller & Lowther, 1969; Teleki, 1973) but is extremely rare among most other primates (Hall & DeVore, 1965). While there is not clear evidence that food sharing in humans, chimps, and social carnivores is homologous, it is interesting to consider some of the possible similarities among these groups, in contrast to other primates such as baboons. Reynolds (1966) has argued that humans evolved in relatively

low-dominance open groups, which were quite similar to those of other large apes. Schaller and Lowther (1969) noted that dominance hierarchies are really not well developed in many of the social carnivore species. The lack of a strongly developed dominance hierarchy has been suggested by Trivers (1971) as one of the conditions that encourages the development of reciprocal altruism in social groups. Baboons, on the other hand, have a very well developed dominance structure (Hall & DeVore, 1965). It may be that the degree of dominance influences the devleopment of at least reciprocal altruism in social groups.

Conclusions and a Comment on Sociology and Biology

In this paper, an evolutionary theory of food altruism has been developed and examined briefly with regard to some hunter-gatherer societies. From this examination, it would appear that considering human food altruists as inclusive fitness actors provides us with viable hypotheses that can shed some light on the evolution of food sharing in humans. Perhaps the most serious limitation confronted in considering these hypotheses is the absence of much quantitative data on food altruism in ethnographies of human societies. Often, the data that was presented was not particularly well oriented to the consideration of evolutionary hypotheses, particularly those developments from a perspective of sociobiology and cultural selection. The development of studies that collect data for the testing of specific sociobiological and cultural evolutionary hypotheses (Irons, forthcoming) would be a valuable activity.

How important is it to consider biological bases of human social behavior? Both sociobiologists and more proximately oriented sociologists (Mazur, 1976; Barchas, 1975) have argued that this consideration is important.

Quite a bit of interesting work has been done in the area that is coming to be known as physiological sociology (Mazur, et. al., no date; Barchas, 1975). For example, the physiological correlates of response to differential status in interaction have been studied, and this has contributed to our understanding of status interaction. There can be no question but that there are physiological processes involved in most of the important micro level interactions that social scientists study.

When the question is whether human social behavior has evolved through natural selection, the evidence is not nearly as strong. While Mazur (1976) has argued that the most important contribution of Wilson's (1975) Sociobiology is the directing of attention to the biological components of social behavior, Wilson's stress on an evolutionary approach in which the adaptiveness of behaviors in an environment is studied is just as important. Whether behaviors evolve naturally or culturally (Durham, forthcoming), an evolutionary approaches adds a missing dimension to contemporary social science analysis of human social behavior. The new dimension is one that acts to counterbalance the extreme relativism that pervades much research on human social behavior. Simply, it is the realization that some behavior and cultures may be more adaptive in a given setting than others.

In conclusion, it is suggested here that evolutionary approaches, whether through the consideration of genetic or cultural selection, are useful tools for the social sciences in that they direct us to the consideration of ultimate causes of social phenomenon. Possible tautalogical problems with the concept of inclusive fitness (Mazur, 1976; Mazur & Robertson, 1972) are dealt with to some extent by operationalizing fitness in terms of genetic representation in future generations. The success

of evolutionarily oriented research, including sociobiological studies should act to encourage the development of functionalistic evolutionary analyses with particular stress on the natural and cultural selection at the individual level.

Footnotes

1. Since the willingness of a hunter to take the chance of getting his finger cut is probably a good indication of his ability to provide for a family, it may be quite adaptive that this is considered a sign of manhood. A female selects a man who is a good provider will be acting to increase her inclusive fitness.

2. Many ethnographies looked at do not discuss the distribution or the sharing of food. It may be that food sharing is not important in many hunter-gatherer societies, but it is more likely that such data is just not collected or presented in many ethnographies.

References

Altmann, S. A., and J. Altmann

1970 Baboon and Ecology: African Field Research. Chicago: University of Chicago Press.

Balikci, A.

1968 "The Netsilik eskimos: Adaptive processes." In R. B. Lee & I. DeVore (Eds.), Man the Hunter. Chicago: Aldine.

Barash, D. P.

1977 Sociobiology and Behavior. New York: Elsevier.

Barchas, P. R.

1975 "Physiological sociology: Interface of sociological and biological processes." Annual Review of Sociology 2: 299-333.

Bowlby, J.

1973 Separation. New York: Basic Books.

Chagnon, N. A., and W. G. Irons

forth-coming "Evolutionary biology and social anthropology." In N. A. Chagnon & W. G. Irons (Eds.), Sociobiology and the Social Sciences. Duxbury.

Damas, D.

1972 "Central eskimo systems of food sharing." Ethnology. 11:220-240.

Dawkins, R.

1976 The Selfish Gene. New York: Oxford University Press.

Dowling, J. H.

1968 "Individual ownership and the sharing of game in hunting societies." American Anthropologist. 70: 502-507.

Durham, W. H.

forth-coming Toward a coevolutionary theory of human biology and culture. In N. A. Chagnon & W. G. Irons (eds.), Sociobiology and the Social Sciences. Duxbury.

Dyson-Hudson, R., & R. Van Dusen

1972 "Food-sharing among young children." Ecology of Food and Nutrition. 1: 319-324.

Foster, G. M.

1967 Tzintzuntzan: Mexican Peasants in a Changing World. Boston: Little, Brown.

Goldschmidt, W.

1966 Comparative Functionalism. Berkeley & Los Angeles: University of California Press.

Gouldner, A.

1960 "The norm of reciprocity: A preliminary statement." American Sociological Review. 47: 73-80.

Hall, K. R. L., & I. DeVore

1965 "Baboon social behavior." In I. DeVore (Ed.), Primate Behavior. New York: Holt, Rinehart & Winston.

Hamilton, W. D.

1964 "The genetical evolution of social behavior. I & II." Journal of Theoretical Biology. 7:1-52.

Hamilton, W. D.

1975 "Innate social aptitudes of man: An approach from evolutionary genetics." In R. Fox (Ed.), Biosocial Anthropology. London: Malaby.

Harris, M.

1974 Cows, Pigs, Wars and Witches. New York: Random House.

Hart, C. W. M., and A. R. Pilling

1960 The Tiwi of North Australia. New York: Holt-Rinehart-Winston.

Henry, J.

1951 "The economics of Pilaga food distribution." American Anthropologist. 53: 187-219.

Irons, W. G.

forthcoming "Emic and reproductive success." In N. A. Chagnon & W. G. Irons (Eds.), Sociobiology and the Social Sciences. Duxbury.

Krebs, D.

1970 "Altruism -- an examination of the concept and a review of the literature." Psychological Bulletin. 73:258-302.

Kruuk, H.

1966 "Clan-system and feeding habits of spotted hyenas (Crocuta crocuta Erxleben)." Nature. 209: 1257-1259.

Lee, R. B.

1968 "What hunters do for a living, or how to make out on scarce resources." In R. B. Lee & I. DeVore (Eds.), Man the Hunter. Chicago: Aldine.

Marshall, L.

1961 "Sharing, talking, and giving: Relief of social tensions among !Kung Bushmen." Africa. 31: 231-249.

Mazur, A.

1976 "On Wilson's Sociobiology." American Journal of Sociology. 82: 697-700.

Mazur, A., and L. S. Robertson

1972 Biology and Social Behavior. New York: Macmillian.

Mazur, A., M. Farpel, J. Heller, R. Leen, C. Riley and E. Rosa

no date Physiological aspects of social sharing. Unpublished paper. Syracuse University.

Parker, S.

1976 "The precultural basis of the incest taboo: Toward a biosocial theory." American Anthropologist. 73: 285-305.

Reynolds, V.

1966 "Open groups in hominid evolution." Man. 1:441-452.

Sahlins, M. D.

1972 "On the sociology of primitive exchange." In M. D. Sahlins, Stone Age Economics. Chicago: Aldine.

Schaller, G. B., and G. R. Lowther

1969 "The relevance of carnivore behavior to the study of early hominids." Southerwestern Journal of Anthropology. 25:307-341.

Service. E. R.

1966 The Hunters. Englewood Cliffs, NJ: Prentice-Hall.

Staub, E., and L. Sherk

1970 "Need for approval, children's sharing behavior and reciprocity in sharing." Child Development. 41:243-252.

Teleki, G.

1973 The Predatory Behavior of Wild Chimpanzees. Lewisberg, PA: Bucknell University Press.

Trivers, R. L.

1971 "The evolution of reciprocal altruism." Quarterly Review of Biology. 46:35-57.

Trivers, R. L.

1972 "Parental investment and sexual selection" In B. Campbell (Ed.), Sexual Selection and the Descent of Man 1871-1971. Chicago: Aldine.

Trivers, R. L.

1974 "Parent-offspring conflict." American Zoologist. 14:249-264.

Turnbull, C. M.

1966 Wayward Servants. London: Eyre & Spottiswoode.

Turnbull, C. M

1972 The Mountain People. New York: Simon & Schuster.

van den Berghe, P. L.

1974 "Bringing beasts back in: Toward a biosocial theory of aggression." American Sociological Review. 39:777-788.

van Lawick-Goodall, H. & J.

1970 Innocent Killers. New York: Ballantine.

Vayda, A. (Ed.)

1969 Environment and Cultural Behavior. Garden City, NY: Natural History Press.

Wilson, E. O.

1975 Sociobiology: The New Synthesis. Cambridge: Harvard Univ. Press.

Woodburn, J.

1968 "An introduction to Hadza economy." In R. B. Lee & I. DeVore (Eds.), Man the Hunter. Chicago: Aldine.

Young, M., and P. Wilmott

1957 Family and Kinship in East London. Baltimore: Penguin.